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CLAIM(S)

An explosion-proof cathode-ray tube, wherein a tape consisting of porous sheet core, normal temperature adhesion bonding layer on one surface, and of normal temperature non-adhesion thermoplastic synthetic resin layer is inserted between a face panel section of the cathode-ray tube and a ring thermally mounted to surround the face panel section, so that said normal temperature adhesion bonding layer faces the said face panel section.

DETAILED DESCRIPTION OF THE INVENTION

The present invention pertains to an explosion proof cathode-ray tube wherein a reinforcing ring surrounding the face panel section of the cathode-ray tube body is thermally mounted on the face panel section. A tape having a porous sheet as its core, a normal temperature adhesion bonding layer on its one surface, and a normal temperature non-adhesion thermoplastic synthetic resin layer on its another surface is inserted between said face panel section and said reinforcing ring, so that said normal temperature adhesion bonding layer side faces said face panel section side; thereby attempting to enhance the reinforcing effect and improve a

process of mounting the reinforcing ring.

With a general explosion-proof cathode-ray tube wherein an reinforcing ring surrounding the face panel section of the cathode-ray tube body, the connection of the reinforcing ring to the cathode-ray tube body is kept well by inserting a normal temperature adhesive tape between the face panel section and the reinforcing ring.

As for said tape, a two-side tape having a normal temperature adhesive bonding layer on both sides is extensively used. With the two-side adhesive tape whose bonding layers are formed by natural rubber or synthetic rubber, the reinforcing ring mounted or wound on the surface of the tape tends to slide, and the reinforcing ring's displacement due to sliding reduces the reinforcing effect and explosion-proof effect.

The two-side adhesive tape before wound on the outer circumferential surface of the face panel section of the cathode-ray tube is wound into a roll along with a release paper called as a separator. The diameter of the winding is normally small taking the loosening of the winding into consideration, but the length of the tape in one roll is actually very short, which makes the tape supply operation complex in the cathode-ray tube manufacturing process, and is a hindrance to improving the operability.

The present invention, to solve the aforementioned problems, attempts to present an explosion-proof cathode-ray tube, the embodiment of which is explained

below with reference to the drawings.

As shown in Fig. 1, the cathode-ray tube body 1 made of color picture tube is reinforced by tape 4 inserted between the face panel section 2 and the reinforcing ring 3 surrounding the face panel section 2. As shown in Fig. 2, the reinforcing ring 3 is made by seam-welding the one edge 6 of the metal band 5 made of steel and the other edge 7 overlapped over it and has tab 8 for attaching the cathode-ray tube at the four corners.

On the other hand, tape 4, as shown in Fig. 3, consists of porous sheet 9 made of screen-like non-woven cloth of nylon or polyester, or woven cloth of glass or man-made silk, normal temperature adhesion bonding layer 10 formed on one surface of the core member of the porous sheet 9, and of normal temperature non-adhesion thermoplastic synthetic resin layer 11 formed on other surface of the porous sheet 9. The tape 4 is wound on the outer circumferential surface of the face panel section 2 positioning the bonding layer 10 inside by using its adhesive force, prior to mounting the reinforcing ring 3.

As for the normal temperature adhesion bonding layer 10, like the bonding layer of the prior art one-side adhesive tape, a thermosetting resin such as epoxy resin or rubber group resin can be coated. As for the normal temperature non-adhesive thermoplastic synthetic resin layer 11, polyethylene, vinyl chloride resin or acrylic resin can be coated. The resin after coated is cured and is not adhesive at a

normal temperature. As for the sequential order of forming the two sides, 10, 11, it is preferred that the synthetic resin layer 11 is formed first, and after it is cured, the bonding layer 10 is formed.

This tape 4 is an one-side tape at a normal temperature, so it can be wound into a large diameter roll without using a release paper. By so doing, the tape supply can be reduced in the process of manufacturing the cathode-ray tubes, and therefore its operability can be improved.

After tape 4 is wound as mentioned earlier on the outer circumferential surface of the face panel section 2, the reinforcing metal ring 3 is mounted, but in this embodiment, the reinforcing ring 3 is preheated to a temperature in the range of 400 - 650°. This heated ring 3 that has been expanded by this heating is applied to the outer periphery of the tape 4. By this shrink fit method, a strong tightening force can be applied to the cathode-ray tube when the reinforcing ring 3 resumes its normal temperature. By this high temperature and the time it takes before returning to its normal temperature, a portion of the normal temperature adhesion thermoplastic synthetic resin layer 11 of the tape 4 is melted and cured. By this, a portion of the melted synthetic resin penetrates the porous sheet 9 comes out to the face panel section 2 side, while simultaneously the thermally deformed synthetic resin is generated around the reinforcing ring 3; thus, the tape 4 and the reinforcing ring 3 are completely bonded. Also, the bonding level between the tape 4 and the

face panel 2 is further reinforced, producing a very excellent explosion-proof effect.

In the aforementioned embodiment, the reinforcing ring 3 is shrink fit, but the reinforcing ring 3 needs not initially be in a ring shape, but it can be formed into a ring by winding the reinforcing metal band on the tape 4 and by tightening after the tape 4 has been wound on the outer circumferential surface of the face panel section 2. In this case, said metal band is heated immediately before or after winding or at a time of winding, but a large glass bulb having a large thermal capacity needs not be heated.

For example, when the porous sheet 9 of tape 4 is made of glass fiber, 30 vertical threads of G - 150 size are used per 25 mm width, and 25 horizontal threads of G - 75 size are used per 25 mm width. As for the thermoplastic synthetic resin 11, a polyethylene resin with 40 - 70 μm thickness can be used. In this case, if an epoxy resin is used for the bonding layer 10, part of the bonding layer 10 penetrates the porous sheet 9 due to tightening of the metal band and oozes out to the metal band side. By this, a double bonding effect is produced by the thermoplastic synthetic resin and thermosetting synthetic resin, so even if the cathode-ray tube is exposed to many heat cycles, the bond will remain stable.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a cut-away view of the explosion-proof cathode-ray tube as one embodiment of the present invention. Fig. 2 shows an oblique view of the

reinforcing ring of the cathode-ray tube. Fig. 3 shows an oblique partial cut-away view of the tape of the cathode-ray tube.

1. Cathode-ray tube

2. Face panel section

3. Reinforcing ring

4. Tape

9. Porous sheet

10. Normal temperature adhesion bonding layer

11. Normal temperature non-adhesion thermoplastic synthetic resin

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